

CLAIMS

1. A glass comprising:

Oxide	Mole %
SiO ₂	35 - 75
GeO ₂	0-10
B ₂ O ₃	0 - 8
Al ₂ O ₃	0 - 8
Li ₂ O	>0 - 25
Na ₂ O	0 - 60
K ₂ O	0 - 6
MgO	0 - 35
Σ BaO, SrO, CaO, ZnO, PbO	0 - 10
TiO ₂	0 - 5
La ₂ O ₃	0 - 30
RE ₂ O ₃	0 - 12
Y ₂ O ₃	>0 - 30
As ₂ O ₃	0 - 0.5
F	0 - 5
Sum R ₂ O ₃ , R=Al, B, La and RE	0 - 40

wherein RE represents rare earth ions, excluding La.

2. A glass according to claim 1, having the following properties:

Property	Range
n_d	> 1.5
T(%) at 1550 nm for 1.0 mm	> 88
CTE (-30 to +70°C) $\times 10^{-7}/^{\circ}\text{C}$	≥ 90 , especially ≥ 110
E (GPa)	> 80
Tg (°C)	≥ 350

3. A glass according to claim 1,

Oxide	Mole %
SiO ₂	40 - 70
GeO ₂	0-5
B ₂ O ₃	0 - 5
Al ₂ O ₃	0 - 5
Li ₂ O	$> 0 - 25$
Na ₂ O	0 - 35
K ₂ O	0 - 5
MgO	0 - 25
Σ BaO, SrO, CaO, ZnO, PbO	0 - 5
TiO ₂	0 - 3
La ₂ O ₃	0 - 12
RE ₂ O ₃	0 - 10
Y ₂ O ₃	$> 0 - 25$
As ₂ O ₃	0 - 0.3
F	0 - 3
Sum R ₂ O ₃ , R=Al, B, La and RE	0 - 40

4. A glass according to claim 3, having the following properties:

Property	Range
n_d	1.50 - 1.70, especially 1.50 - 1.65
T(%) at 1550 nm for 1.0 mm	> 90
CTE (-30 to +70°C) $\times 10^{-7}/^{\circ}\text{C}$	> 100, especially > 110
T _g (°C)	≥ 400
E [GPa]	> 85

5. A glass comprising:

Oxide	Mole %
SiO ₂	40-60
GeO ₂	0-10
B ₂ O ₃	0-10
Al ₂ O ₃	0-4
Li ₂ O	> 0-26
Na ₂ O	> 0-26
K ₂ O	0-15
MgO	0-15
Σ BaO, SrO, CaO, ZnO, PbO	0-10
TiO ₂	0-9
ZrO ₂	0-2
La ₂ O ₃	0-4
Re ₂ O ₃	0-4
Y ₂ O ₃	> 0-5
Sc ₂ O ₃	0-4
Nb ₂ O ₅	0-2
F	0-5

$\sum R_2O_3$, R=Al, B, La, and RE	0-25
As_2O_3	0-0.5

wherein RE represents rare earth ions, excluding La.

6. A glass according to claim 5, having the following properties:

Property	Range
n_d	> 1.5
T(%) at 1550 nm for 1.0 mm	> 88
CTE (-30 to +70°C) $\times 10^{-7}/^\circ C$	≥ 90
E (GPa)	> 80
T _g (°C)	≥ 350

7. A glass according to claim 5 comprising:

Oxide	Mole %
SiO ₂	45-55
GeO ₂	0-5
B ₂ O ₃	0-8
Al ₂ O ₃	0-2
Li ₂ O	> 0-17
Na ₂ O	> 0-19
K ₂ O	0-6
MgO	0-13
\sum BaO, SrO, CaO, ZnO, PbO	0-5
TiO ₂	0-5
ZrO ₂	0-1
La ₂ O ₃	0-3
RE ₂ O ₃	0-3

Y ₂ O ₃	>0-4.5
Sc ₂ O ₃	0-3
Nb ₂ O ₅	0-1
F	0-3
Σ R ₂ O ₃ , R=Al, B, La, and RE	0-15
As ₂ O ₃	0-0.3

8. A glass according to claim 7, having the following properties:

Property	Range
n _d	1.50-1.70
T(%) at 1550 nm for 1.0 mm	> 90
CTE (-30 to +70°C) x 10 ⁻⁷ /°C	≥ 100
T _g (°C)	≥ 400
E [GPa]	> 85

9. A glass comprising:

Oxide	Mole %
SiO ₂	45.0-58.0
B ₂ O ₃	0.0-5.0
Al ₂ O ₃	0.0-3.0
Li ₂ O	6.5-16.5
Na ₂ O	7.0-24.0
K ₂ O	0.0-12.0
MgO	0.0-8.0
CaO	0.0-8.0

SrO	0.0-8.0
BaO	0.0-8.0
TiO ₂	0.0-12.0
ZrO ₂	0.5-5.5
Ta ₂ O ₅	0.0-1.0
Gd ₂ O ₃ + La ₂ O ₃ + Y ₂ O ₃	2.70-3.30
As ₂ O ₃	0.0-0.15

wherein RE represents rare earth ions, excluding La.

10. A glass according to claim 9, having the following properties:

Property	Range
n_d	> 1.5
T(%) at 1550 nm for 1.0 mm	> 88
CTE (-30 to +70°C) $\times 10^{-7}/^{\circ}\text{C}$	≥ 90
E (GPa)	> 80
T _g (°C)	400-485

11. A glass according to claim 9, comprising:

Oxide	Mole %
SiO ₂	46.0-52.0
Al ₂ O ₃	0.0-1.5
B ₂ O ₃	0.0-1.0
Li ₂ O	7.0-16.0
Na ₂ O	7.0-20.0
K ₂ O	4.0-12.0
MgO	0.0-7.5
CaO	0.0-7.5
SrO	0.0-7.5
BaO	0.0-7.5
TiO ₂	1.0-10.5
ZrO ₂	1.5-5.0
Ta ₂ O ₅	0.3-0.7
La ₂ O ₃ + Gd ₂ O ₃ + Y ₂ O ₃	2.6-2.9
As ₂ O ₃	0.0-0.15

12. A glass according to claim 11, having the following properties:

Property	Range
n_d	1.50 - 1.70
T(%) at 1550 nm for 1.0 mm	> 88
CTE (-30 to +70°C) $\times 10^{-7}/^{\circ}\text{C}$	> 100
T _g (°C)	415-480
E [GPa]	> 80

13. An interference filter comprising a glass substrate having at least two interference layers coated thereon, wherein the glass substrate is a glass according to claim 1.

14. An interference filter comprising a glass substrate having at least two interference layers coated thereon, wherein the glass substrate is a glass according to claim 5.

15. An interference filter comprising a glass substrate having at least two interference layers coated thereon, wherein the glass substrate is a glass according to claim 9.

16. A fiber optic system comprising a light source, a fiber optic transmission component, a receiver of transmitted radiation and an interference filter comprising a glass substrate having at least two interference layers coated thereon, said glass substrate comprising a glass according to claim 1.

17. A fiber optic system comprising a light source, a fiber optic transmission component, a receiver of transmitted radiation and an interference filter

comprising a glass substrate having at least two interference layers coated thereon, said glass substrate comprising a glass according to claim 5.

18. A fiber optic system comprising a light source, a fiber optic transmission component, a receiver of transmitted radiation and an interference filter comprising a glass substrate having at least two interference layers coated thereon, said glass substrate comprising a glass according to claim 9.

19. A process for making a glass according to claim 1, comprising melting raw materials corresponding to oxides in the glass, refining a resultant glass melt, casting the melt in a mold and optionally annealing.

20. A process for making a glass according to claim 1, comprising casting into a mold a glass melt produced from raw materials corresponding to oxides in the glass.

21. A process for making a glass according to claim 5, comprising casting into a mold a glass melt produced from raw materials corresponding to oxides in the glass.

22. A process for making a glass according to claim 9, comprising casting into a mold a glass melt produced from raw materials corresponding to oxides in the glass.

23. A demultiplexing optical component comprising the interference filter of claim 13.

24. A demultiplexing optical component comprising the interference filter of claim 14.

25. A demultiplexing optical component comprising the interference filter of claim 15.

26. A method of demultiplexing, comprising passing an optical signal of multiple wavelengths through a demultiplexing optical component according to claim 23.

27. A method of demultiplexing, comprising passing an optical signal of multiple wavelengths through a demultiplexing optical component according to claim 24.

28. A method of demultiplexing, comprising passing an optical signal of multiple wavelengths through a demultiplexing optical component according to claim 25.

10036486 . 010702